

Knowledge domain: Mechanical
Unit: Casing
Skill: Latches, Locks, and Interlocks

Tools and Parts Required:

- 1) **Hasp**
- 2) **Hand drill**
- 3) **7 screws**
- 4) **Screwdriver**
- 5) **Padlock**
- 6) **Wooden chips/plugs/matchsticks**
- 7)

Introduction

Latches, locks, and interlocks are fasteners that hold things closed. Usually latches, locks, and interlocks are found on doors, lids and cases. This skill is an overview of different kind of fasteners.

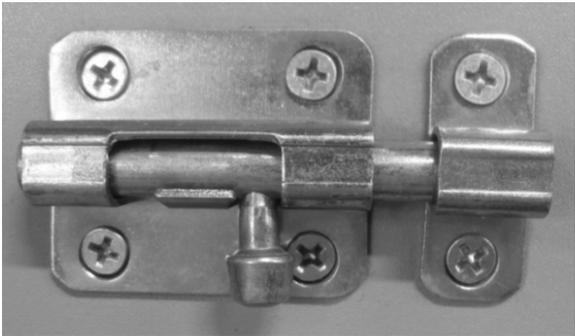
A **latch** is a mechanical fastener that joins two objects together. A latch is not a locking device. Latches hold doors closed. There are different types of door latches.

Locks are on doors, vehicles, cabinets, and other containers. Locks are opened with a key or a combination. A key has grooves on either side. The lock or combination has grooves inside the keyway cylinder. When a key is inserted into a lock, the grooves on the key align with the grooves in the keyway. If the grooves are complimentary to each other, the cylinder inside the lock will be allowed to rotate freely. The key can then be rotated to open the lock. If the grooves of the key and lock are not complimentary, the cylinder will not rotate. Locks are usually used with latches. There are other kinds of keys. Skeleton keys are often used.

An **interlock** is a type of fastener that ensures safe operation of a device. An interlock prevents a machine from harming its operator. Interlocks also prevent damage to the machine by stopping the machine when triggered. Interlocks are different on different types of equipment. Interlocks are found on doors and lids. The interlock may prevent the machine from operating when the door or lid is open. A broken interlock may prevent the device from operating even if the door is closed. Or, a broken interlock may allow the device to operate, even if the door is open. Be careful to not break, damage, or override interlocks. This skill will not address specific types of interlocks.

Example

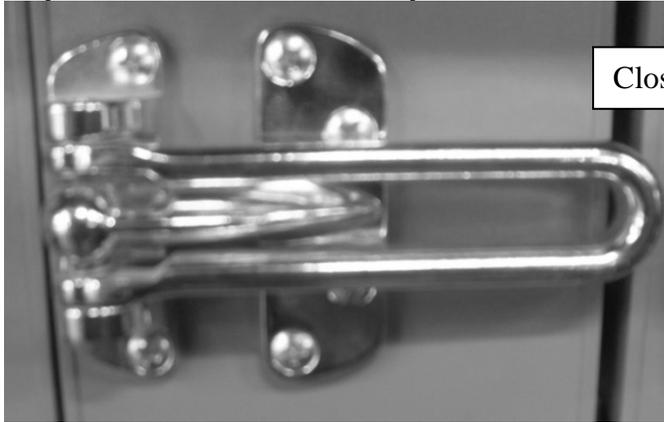
Below are pictures of different types of latches.



Identification and Diagnosis

The most common door latches are security latches, hasps, deadbolt latches, and crossbars.

Security door latches are installed on the inside of doors. Security door latches are very difficult to break. Security door latches have two parts made out of metal.



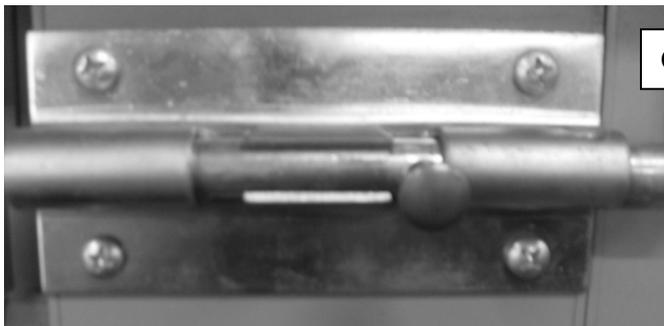
Closed security latch

Hasps are a very common type of latch. Hasps are two pieces of metal that can be secured with a padlock.



Hasp

A **crossbar** is a bolt mounted on the side of a door. The bolt slides past the frame to block the door from opening.



Crossbar

Deadbolt latches are a locking device. Deadbolt latches are used on exterior doors for security. The deadbolt latch is a bolt that fits into the door frame when the door is closed. Deadbolt latches are also classified as locks.



Deadbolt Latch

Padlocks pass through a latch to secure two pieces together. Use a padlock to secure hasps and many other types of latches.

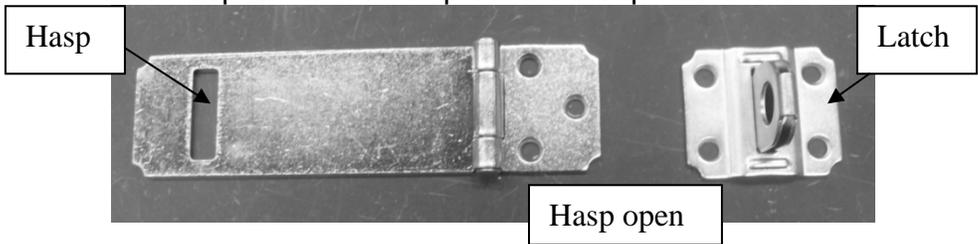


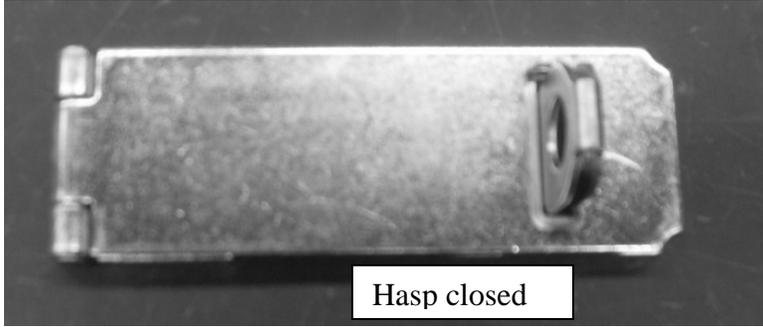
Padlock

Procedure

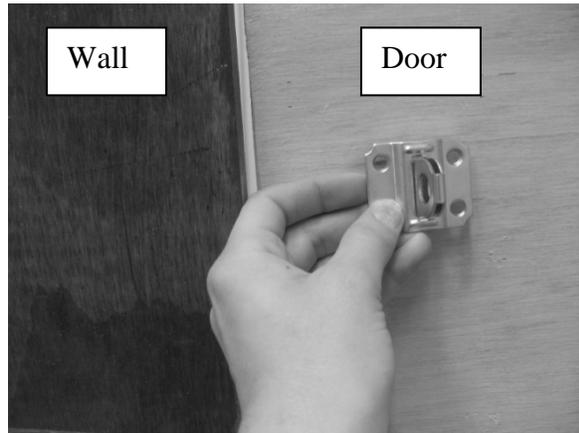
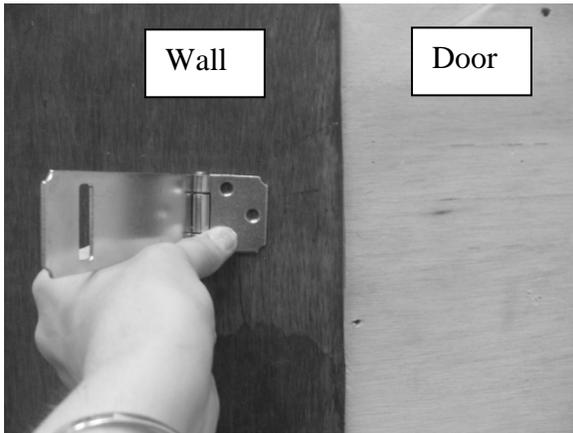
This procedure demonstrates how to install a hasp. You will use a similar method to install other latches. If you need to replace a lock, consult a locksmith. To replace or repair interlocks on machines, consult the manual.

The hasp latch has two pieces: a hasp and a latch.





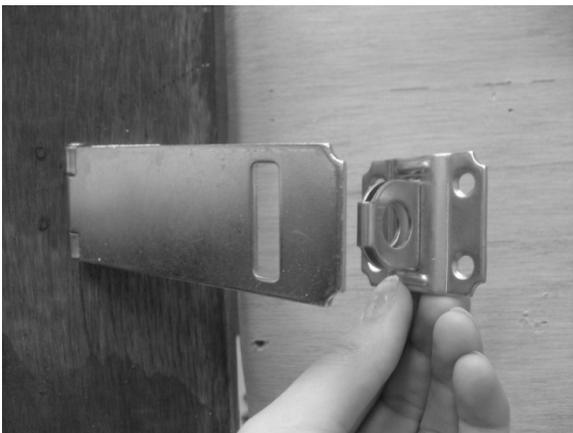
The latch is installed on the door. The hasp is installed on the wall next to the door.



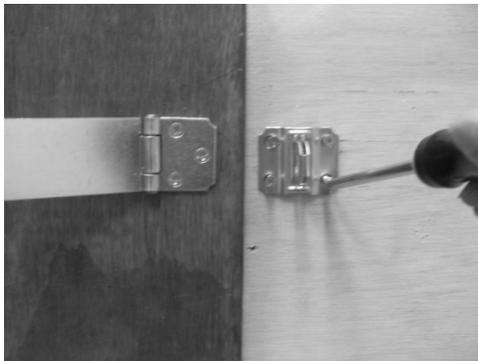
Hold the hasp on the door. The hasp is attached to the door with screws. Use a pencil to mark the places to drill holes for the screws.



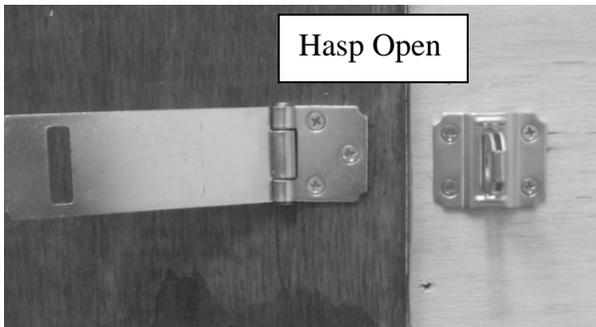
Use a drill to make small pilot holes. Place hasp over the pilot holes. Insert screws through hasp and into pilot holes. Tighten screws with a screwdriver.



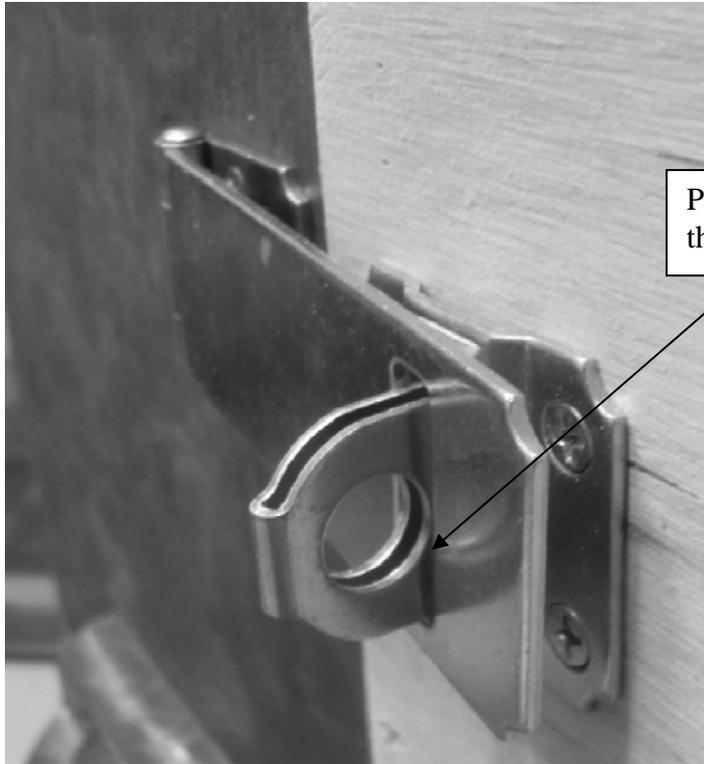
Close the hasp onto the latch. This will ensure that the hasp and latch close correctly. Hold the latch in place on the wall. The latch is attached to the wall with screws. Use a pencil to mark the places to drill holes for the screws. Use a drill to make small pilot holes. Place latch over the pilot holes. Insert screws through latch and into pilot holes. Tighten screws with a screwdriver.



Now the hasp is installed.



Close the hasp. Open a padlock. Put the padlock through the latch. Close the padlock. Now the padlock must be opened before the hasp and door can be opened.



Padlock goes through latch

Precaution

Any wooden surface, when drilled into, develops wear over a period of time. Wear is especially noticeable in holes drilled to support heavy mechanical fastenings like latches or hasps.

Wear or widening of the drilled hole can be identified by visual inspection. When the screw moves freely inside the drilled hole this indicates a loose contact between the screw and the wood. The latch or hasp attached will hang loosely.

To correct for this, remove the latch or hasp and screws. Visually inspect the hole. Use pieces of wood or matchsticks to plug the hole and make it smaller. Re-insert the screws and fastening. Check for a tight, immovable fit. Use as much wood or matchstick material as needed to make the fit between the screw and the hole as tight as possible.

You may also use a bigger screw to ensure good fit. Remove the previous screws and fastenings and replace with bigger screws. Check for good fit and appropriately choose the diameter of the screw. Such a method should be avoided unless necessary. Use of bigger screws each time will successively make the drilled hole bigger. Gradual increase in hole diameter will eventually destroy the wooden surface.

Exercise

Your instructor will give you a hasp and two pieces of wood. Follow the Procedure to install the hasp on the wood. Once the hole is drilled, try using the wooden pieces or matchsticks available to affix the hasp with a smaller diameter screw as well.

Your instructor must verify your work before you continue.

Preventative Maintenance and Calibration

Check the fasteners on cases of medical equipment when performing routine maintenance. Fasteners help with user safety. Ensure that users have not disabled or removed latches, locks, or interlocks. Lubricate fasteners about once per year to prevent them from rusting shut.

Always calibrate every medical device before returning it to use.